

Remarks

Upon entry of the foregoing amendment, claims 55-84, 106-111, 113, 114, 130-148 are pending in the application, with claims 55, 56, 71, 72, 106, 113 and 136 being the independent claims. Claims 72-84, 106-111, 136-137 and 141 are withdrawn from consideration. Claims 64, 70, 71, 114, 135, 138, 140, 142-144 and 147 are sought to be amended. The claims have been amended to alter claim dependencies, correct a spelling error, and provide antecedent basis support for limitations, and therefore do not introduce new matter.

The specification has been amended to indicate that a benefit application has issued as a U.S. patent.

Based on the above amendments and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Sequence Compliance

The Examiner indicated that the application contains several figures that recite nucleotide sequences that must comply with rules set forth in 37 C.F.R. § 1.821 through § 1.825. Applicant has amended the specification to insert the sequence identifiers and note that the sequences identified by the Examiner and the Applicant are present in the sequence listing as filed. Accordingly, Applicant requests reconsideration and withdrawal of the requirement to submit a computer readable form containing the SEQ ID numbers and paper copy of the sequence listing.

Claim Objections

The Examiner rejected claims 131-133 and 135 for being dependent on withdrawn claims 72 and 106. The Examiner also objected to claims 142-144 for being dependent on withdrawn claim 141. Applicant has amended the claims to remove the dependencies on the withdrawn claims. Applicant respectfully requests that the Examiner withdraw the objection.

Rejections under 35 U.S.C. § 112

The Examiner rejected claims 63, 70, 71, 114, 131-133, 135, 138-140, and 142-148 under 35 U.S.C. § 112, second paragraph, as allegedly indefinite. Applicant respectfully traverses these rejections.

Specifically, the Examiner asserted that claim 63 is indefinite for recitation of the limitation "said chain terminator." The Examiner contends that there is insufficient antecedent basis for this limitation in the claim with respect to its dependency on claims 55 and 56. The limitation "said chain terminator" does not appear in claim 63. However, this limitation does appear in claim 64. Applicant has deleted "chain" from the limitation and submits that "said terminator" has sufficient antecedent basis in claims 55 and 56. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection.

The Examiner rejected claim 70, alleging that there is insufficient antecedent basis for the limitation "said target pathogen polynucleotide" in the claim with respect to its dependency on claim 55. Applicant has amended claim 70 to remove its dependency

on claim 55. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection.

The Examiner rejected claim 71, and claims 131-133, 135, 138-140, and 142-148 dependent thereon as allegedly indefinite for recitation of the phrase "hybridizing a single stranded target polynucleotide" in step (b). The Examiner contended that it is indefinite whether "a single stranded target polynucleotide" referred to in the claim is the same target polynucleotide which is hybridized to the capture probe in part (b) or an entirely different target polynucleotide. Applicant has amended the claim limitation so that it refers to the target polynucleotide in part (b). Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection.

The Examiner has rejected claim 114, stating that the claim recites "further comprising" steps (a) and (b) and it is unclear if the steps are to replace steps (a) and (b) of claim 113, or be conducted before or after the steps recited in claim 113. The phrase "further comprising" indicates that the recited elements are in addition to, and not in replacement of, the elements of the claim from which it depends. However, Applicant has cancelled the heading style (a) and (b) in claim 114 to more specifically indicate that the steps are not to replace steps (a) and (b) in claim 113. The specification sets forth that the method steps may be executed in any order and are not limited to the order presented in the claims. See p. 101 of the specification. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection.

The Examiner rejected claim 138 stating that it depends from itself. Applicant has amended claim 138 to remove the self-dependency and respectfully requests withdrawal of the rejection.

The Examiner rejected claim 147, alleging that there is insufficient antecedent basis for "the RNA-dependent RNA polymerase" recited in the claim. Claim 147 is dependent from claim 144, which is multiply dependent on claims 55, 56, 71 and 113. Applicant has amended claim 147 to remove its dependency from claim 144 and make it dependent on claim 146, which recites "an RNA-dependent RNA polymerase." As such, Applicant respectfully submits that there is proper antecedent basis for the limitation "the RNA-dependent RNA polymerase" recited in claim 147. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection.

Rejection under 35 U.S.C. § 102

The Examiner has rejected claims 55, 57-59, 61-68, 70 and 131-135 under 35 U.S.C. § 102(b) as allegedly anticipated by Sasaki *et al.* (*Proc Natl Acad Sci USA*, 95:3455-3460 (1998)). Applicant respectfully traverses this rejection.

Under 35 U.S.C. § 102, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The crux of the Examiner's argument is that the limitation "abortive promoter cassette" is not specifically defined by the specification, and that the limitation encompasses any structure which comprises promoter sequence that is capable of effecting abortive reiterative synthesis. The Examiner also alleges that Sasaki *et al.* teaches steps (a)-(d) of claim 55 and points to various disclosures in the cited art in alleged support thereof. The Examiner indicated that amending the claims to recite the

structure of the "abortive promoter cassette" as exemplified in Figure 19 would overcome the rejection.

Applicant kindly thanks the Examiner for suggesting claim amendments which would overcome the Examiner's rejection. However, the Applicant believes that such amendments are unnecessary because the Applicant respectfully disagrees with the Examiner's analysis on a number of grounds.

First, the specification sets forth what is encompassed by the limitation "abortive promoter cassette" (APC). According to the specification, APCs are self-complementary and form a transcription bubble region from which transcription initiates. An Abortive Promoter Cassette (APC) consists of one or more oligonucleotides or polynucleotides that together create a specific binding site for a polymerase. The APCs can be coupled to a linker region for attachment to target molecules such as DNA, RNA, or protein. The APC can be a DNA duplex, one strand each of RNA and DNA (DNA-RNA hybrid), or an RNA duplex. See, e.g. p. 14-15, 23-25, 55-57 and 90-92 of the specification.

The claimed invention requires hybridizing a target polynucleotide with an APC. Thus, the claims require that the APC, in addition to being self-complementary and forming a bubble region, also hybridize with a target sequence. Sasaki *et al.* do not describe hybridization of an APC to a target polynucleotide. Sasaki *et al.* report hybridizing single stranded primers harboring T3 or T7 promoters to a target template sequence to effect "transcriptional sequencing." See p. 3457, Fig. 4 of Sasaki *et al.* The structure formed by such hybridization is not an APC because the structure includes the target sequence. However, whether or not the structure is an APC is not even material, because Sasaki *et al.* do not further hybridize this structure with a target polynucleotide

as required by the claims. Accordingly, for at least this reason, Sasaki *et al.* do not anticipate the Applicant's claimed invention.

Second, Sasaki *et al.* further do not anticipate the claimed invention because they do not teach a "reiterative" synthesis.

According to the Applicant's specification, "reiterative" refers to "multiple identical or highly similar copies of a sequence of interest." See p. 32 of the specification. Sasaki *et al.* report a sequencing method using RNA polymerase, referred to as "transcriptional sequencing." Sasaki *et al.* use four color dye-3'-dNTPs as dye terminators in the reaction. See p. 3455 of Sasaki *et al.* Use of four dye-dNTP terminators allows the reaction to be run in a single tube and generates sequencing products that are heterogeneous in size. The dye terminators are present in low amounts in the reaction relative to unlabelled dNTPs and therefore incorporate at a specified position in only a small percentage of transcripts. This generates transcripts that are heterogeneous in size and allows for individual fragments to be separated by electrophoresis. In this manner, the nucleotide at each base position can be determined. The fragments range in size from about the size of the primer (usually about 20 nucleotides) to greater than several hundred bases in length. Sasaki *et al.* report a transcriptional sequencing reaction which generate fragments that range up to at least 600 nucleotides in length. *Id.* at p. 3458, Fig. 5A. Clearly, such heterogeneous fragments are not the products of a reiterative process because they are not "identical or highly similar copies." Therefore, Applicant respectfully submits that Sasaki *et al.* do not anticipate the claimed invention. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection.

Rejection under 35 U.S.C. § 103

The Examiner rejected claims 56, 57-71, 113, 114, 130-135, 138-140 and 142-148 under 35 U.S.C. § 103(a) as allegedly unpatentable over Sasaki *et al.* in view of Kang *et al.* (U.S. Patent No. 6,268,131). The Examiner applied the alleged teachings of Sasaki *et al.* as described above. The Examiner further contended that Sasaki *et al.* do not explicitly disclose that their method would be used in the detection of pathogen in a test sample, such as RNA virus, or that an RNA dependent RNA polymerase is used for the transcription, or that the RNA-dependent RNA polymerase is a poliovirus RNA polymerase. The Examiner alleged that Kang *et al.* disclose a method of sequencing nucleic acid via use of RNA-dependent RNA polymerases, wherein the transcription of the template is initiated by a promoter sequence. The Examiner further contended that Kang *et al.* teaches an embodiment wherein the primer is immobilized on a solid surface. The Examiner concluded that it would have been *prima facie* obvious to one of ordinary skill in the art to combine the teachings in the cited art for the purpose of detection/characterizing pathogens in a sample. The Examiner contended that the skilled artisan would have been motivated to combine the cited art to detect pathogens, such as RNA-based pathogens, and would have had a reasonable expectation of success. The Examiner indicated that amending the claims to recite the structure of the "abortive promoter cassette" as exemplified in Figure 19 would overcome the rejection. Applicant respectfully traverses this rejection.

As set forth above, Applicant respectfully disagrees with the Examiner's interpretation of Sasaki *et al.* Therefore, even if the teachings of Sasaki *et al.* and Kang *et al.* were properly combinable under 35 U.S.C. §103(a), which the Applicant does not

concede, the combination would not lead to the Applicant's claimed invention because Sasaki *et al.*, neither alone nor in combination with Kang *et al.*, teaches or even suggests hybridizing an APC with a target polynucleotide or a reiterative synthesis reaction as claimed. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection.

Obviousness-type Double Patenting

The Examiner rejected or provisionally rejected claims 55-71, 113, 114, 130-135, 138-140 and 142-148 for obviousness-type double patenting over various claims of the Applicant's issued patent and copending applications. Specifically, the Examiner rejected the Applicant's claims over the following: claims 1-34 of U.S. Patent No. 7,045,319; claims 26, 27, 103, 112, and 136-139 of copending Application No. 10/488,971; claims 1-22, 32-34 and 44 of copending Application No. 10/976,240; claims 11-27 of copending Application No. 10/425,037; and pending and/or elected claims of copending Application No. 10/600,045; 10/602,045; and 10/607,136.

Applicant respectfully requests clarification of the rejection over claims of Application No. 10/600,045 ("High pressure mercury lamp and lamp unit"), which is abandoned.

Application Nos. 10/602,045, 10/607,136 and the present application are all divisional applications arising from a restriction requirement in Application No. 09/984,664, and were filed prior to the issuance of Patent No. 7,045,319 B2. Under 35 U.S.C. § 121:

A patent issuing on an application with respect to which a requirement for restriction under this section has been made, or on an application filed as a result of such a requirement, shall not be used as a reference either in the

Patent and Trademark Office or in the courts against a divisional application or against the original application or any patent issued on either of them, if the divisional application is filed before the issuance of the patent on the other application.

Accordingly, the claims of U.S. Patent No. 7,045,319 B2 and copending Application Nos. 10/602,045 and 10/607,136 cannot be properly cited under the doctrine of obviousness-type double patenting against those of the present application.

Applicant respectfully requests that the Examiner reconsider and withdraw these rejections, or hold the present rejections in abeyance, pending the identification of otherwise allowable subject matter, at which time Applicant will consider filing any necessary terminal disclaimers.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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